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A CATALOG OF QUADRI/TRIVALENT GRAPHS

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BY

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JANUARY, 1974

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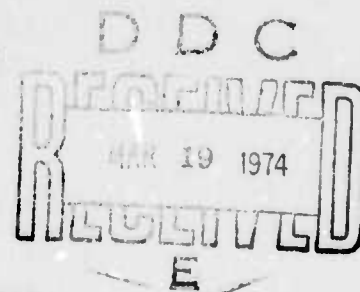
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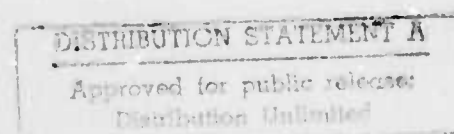
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A CATALOG OF QUADRI/TRIVALENT GRAPHS

by

N. S. Sridharan
Heuristic Programming Project

ABSTRACT: In a previous report [1] a method for computer generation of quadri/trivalent "vertex-graphs" was presented in detail. This report is a catalog of 13 classes of graphs generated by using this method.

This work was supported by ARPA Contract DAHC 15-73-C-0435 and NIH Grant RR00612-03.

INTRODUCTION

A "vertex-graph" is a graph satisfying the following constraints:

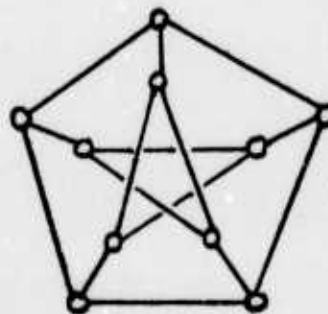
- i) Its vertices are of valence 3 or higher;
- ii) It is at least 2-edge-connected, i.e., no bridges;
- iii) Its vertices have no self-loops.

The above definition permits multiple edges between vertices, i.e., multi-graphs.

A previous paper indicated the need for the availability of a complete list of vertex-graphs for specified degree sequences and the usefulness of such a list to a computer program [2] that generates a complete list of isomers based on a specified atomic composition. Chemical atoms of valence higher than 4 are rare and thus our attention here is confined to vertex-graphs $G(t,q)$ having t vertices of valence 3 and q vertices of valence 4.

The computer method presented in [1] uses the sub-methods of "Edge Labelling" and "Vertex-Pair Promotion", and generates $G(t,q)$ graphs from $G(t+2q)$ graphs, i.e., from Trivalent Regular Graphs.

Lederberg [3] has presented a listing of $G(t,0)$ graphs which was used in generating the graphs presented at the end of this report. Lederberg's lists are complete for $t=2,4,6$ and 8. For $t=10$ the only (non-Hamiltonian, non-planar) graph that was not listed was the Petersen graph shown below.



RESULTS

Table 1 shows the number of $G(t,0)$ graphs. Table 2 lists the number of quadri/trivalent graphs that were derived. The Appendix gives a complete list of graphs.

REFERENCES

1. N. S. Sridharan, "Computer Generation of Vertex-Graphs", Stanford Computer Science Memo STAN-CS-73-381, Stanford University, California, July, 1973.
2. H. Brown and L. Masinter, "An Algorithm for the Construction of the Graphs of Organic Molecules", to appear in DISCRETE MATHEMATICS, 1974.
3. J. Lederberg, "DENDRAL-64" Part II. Topology of Cyclic Graphs, NASA Technical Report CR 68898, 1965.

TRIVALENTS

2
4
6
8
10

NUMBER OF GRAPHS

1
2
5
16
66Table I. Number of $G(t,o)$ graphs.

<u>GRAPHS HAVING</u> <u>TRIVALENTS</u>	<u>QUADRIVALENTS</u>	<u>COUNT</u>	<u>TRIVALENTS IN</u> <u>BASIS GRAPH</u>
2	1	1	4
4	1	5	6
6	1	24	8
8	1	180	10
2	2	4	6
4	2	34	8
6	2	297	10
0	3	1	6
2	3	12	8
4	3	186	10
0	4	3	8
2	4	54	10
0	5	6	10

Table II. SUMMARY OF RESULTS PRESENTED

APPENDIX. THE CATALOG OF $G(t,q)$ GRAPHS FOR THE THIRTEEN CLASSES PRESENTED
IN TABLE II.

Explanation of Format:

No attempt has been made to derive canonical numberings for the graphs. Each graph is listed on two lines. The first line is an arbitrary sequence number that begins with 1 for each class presented. The second line is a list of edges. All graphs are undirected.

Disclaimer:

These tables carry no guarantee of accuracy since there is always the possibility of undetected hardware or software errors. There are no known errors prior to the time of this reporting and the author is reasonably sure of the results.

<u>Graphs List</u>		begins on	<u>Page</u>
<u>t</u>	<u>q</u>		
2	1	. . . . .	7
4	1	. . . . .	8
6	1	. . . . .	9
8	1	. . . . .	11
2	2	. . . . .	19
4	2	. . . . .	20
6	2	. . . . .	22
0	3	. . . . .	34
2	3	. . . . .	35
4	3	. . . . .	36
0	4	. . . . .	44
2	4	. . . . .	45
0	5	. . . . .	48

CATALOG21 (1 Entry)

1

1-2 1-2 1-3 1-3 2-3

CATALOG41 (5 Entries)

1							
1-2	1-3	1-4	1-5	2-3	2-5	3-4	4-5
2							
1-2	1-2	1-3	2-4	2-5	3-4	3-5	4-5
3							
1-2	1-3	1-4	1-5	2-3	2-3	4-5	4-5
4							
1-2	1-2	1-3	1-3	2-4	3-5	4-5	4-5
5							
1-2	1-2	1-3	2-3	2-4	3-5	4-5	4-5

CATALOG61 (24 Entries)

1											
1-2	1-2	1-7	1-7	2-3	3-4	3-4	4-5	5-6	5-6	6-7	
2											
1-2	1-2	1-7	2-3	3-4	3-4	3-5	4-7	5-6	5-6	6-7	
3											
1-2	1-2	1-5	1-7	2-3	3-4	3-4	4-5	5-6	6-7	6-7	
4											
1-2	1-2	1-5	2-3	3-4	3-4	4-5	5-6	5-7	6-7	6-7	
5											
1-2	1-2	1-7	2-3	2-3	3-4	4-5	4-7	5-6	5-6	6-7	
6											
1-2	1-2	1-7	2-3	3-4	3-4	4-5	5-6	5-6	5-7	6-7	
7											
1-2	1-2	1-3	2-3	3-4	3-7	4-5	4-7	5-6	5-6	6-7	
8											
1-2	1-2	1-7	2-3	3-4	3-7	4-5	4-5	4-6	5-6	6-7	
9											
1-2	1-2	1-7	2-3	3-4	3-6	4-5	4-7	5-6	5-6	6-7	
10											
1-2	1-2	1-7	2-3	2-4	3-4	3-7	4-5	5-6	5-6	6-7	
11											
1-2	1-2	1-4	2-3	3-4	3-5	4-5	4-7	5-6	6-7	6-7	
12											
1-2	1-2	1-7	2-3	3-4	3-4	3-6	4-5	5-6	5-7	6-7	
13											
1-2	1-2	1-6	1-7	2-3	3-4	3-4	4-5	5-6	5-7	6-7	
14											
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16											
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17											
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19											
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22											
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23											
1-2	1-2	1-4	1-7	2-3	3-4	3-6	4-5	5-6	5-7	6-7	
24											

1-2 1-2 1-7 2-3 2-4 3-4 3-6 4-5 5-6 5-7 6-7

CATALOG81 (180 Entries)

1													
1-2	1-3	1-9	2-3	2-5	3-4	4-5	4-6	4-7	5-6	6-8	7-8	7-9	8-9
2													
1-2	1-3	1-9	2-3	2-4	3-4	4-5	4-6	5-6	5-8	6-7	7-8	7-9	8-9
3													
1-2	1-3	1-9	2-3	2-4	2-5	3-4	4-6	5-6	5-8	6-7	7-8	7-9	8-9
4													
1-2	1-3	1-8	1-9	2-3	2-5	3-4	4-5	4-7	5-6	6-7	6-9	7-8	8-9
5													
1-2	1-3	1-9	2-3	2-4	3-4	4-5	4-7	5-6	5-9	6-7	6-8	7-8	8-9
6													
1-2	1-3	1-9	2-3	2-5	3-4	4-5	4-7	5-6	5-9	6-7	6-8	7-8	8-9
7													
1-2	1-3	1-9	2-3	2-4	3-4	3-7	4-5	5-6	5-9	6-7	6-8	7-8	8-9
8													
1-2	1-3	1-6	1-9	2-3	2-5	3-4	4-5	4-8	5-6	6-7	7-8	7-9	8-9
9													
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10													
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11													
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20													
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21													
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22													
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72													
1-2	1-2	1-9	2-3	2-4	3-4	3-8	4-5	5-6	5-9	6-7	6-7	7-8	8-9
73													
1-2	1-2	1-6	1-9	2-3	3-4	3-5	4-5	4-9	5-6	6-7	7-8	7-8	8-9
74													
1-2	1-2	1-4	2-3	3-4	3-5	4-5	4-9	5-6	6-7	6-8	7-8	7-9	8-9
75													
1-2	1-2	1-9	2-3	2-4	3-4	3-9	4-5	5-6	5-7	6-7	6-8	7-8	8-9
76													

1-2	1-2	1-9	2-3	3-4	3-5	4-5	4-9	5-6	5-7	6-7	6-8	7-8	8-9
77													
1-2	1-2	1-4	1-9	2-3	3-4	3-5	4-5	5-6	6-7	6-8	7-8	7-9	8-9
78													
1-2	1-2	1-4	1-9	2-3	3-4	3-5	4-5	5-6	6-7	6-9	7-8	7-8	8-9
79													
1-2	1-2	1-9	2-3	2-4	3-4	3-9	4-5	5-6	5-8	6-7	6-7	7-8	8-9
80													
1-2	1-2	1-4	2-3	3-4	3-5	4-5	4-9	5-6	6-7	6-9	7-8	7-8	8-9
81													
1-2	1-2	1-9	2-3	3-4	3-5	4-5	4-9	5-6	5-8	6-7	6-7	7-8	8-9
82													
1-2	1-2	1-9	2-3	3-4	3-5	4-5	4-9	5-6	6-7	6-7	6-8	7-8	8-9
83													
1-2	1-2	1-9	2-3	3-4	3-5	4-5	4-9	5-6	6-7	6-8	6-9	7-8	7-8
84													
1-2	1-2	1-9	2-3	3-4	3-5	4-5	4-9	5-6	6-7	6-8	7-8	7-8	8-9
85													
1-2	1-2	1-9	2-3	3-4	3-5	4-5	4-5	5-6	6-7	6-9	7-8	7-8	8-9
86													
1-2	1-2	1-9	2-3	3-4	3-5	3-6	4-5	4-5	6-7	6-9	7-8	7-8	8-9
87													
1-2	1-2	1-9	2-3	3-4	3-6	4-5	4-5	5-6	6-7	6-9	7-8	7-8	8-9
88													
1-2	1-2	1-9	2-3	3-4	3-4	3-5	4-5	5-6	6-7	6-9	7-8	7-8	8-9
89													
1-2	1-2	1-7	1-9	2-3	3-4	3-6	4-5	4-5	5-6	6-7	7-8	3-9	8-9
90													
1-2	1-2	1-9	2-3	3-4	3-6	4-5	4-8	4-9	5-6	5-8	6-7	7-8	7-9
91													
1-2	1-2	1-9	2-3	3-4	3-6	4-5	4-8	5-6	5-7	5-8	6-7	7-9	8-9
92													
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93													
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94													
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95													
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96													
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97													
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98													
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99													
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100													
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101													
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102													

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103													
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104													
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105													
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106													
1-2	1-2	1-6	1-9	2-3	3-4	3-7	4-5	4-5	5-6	6-7	7-8	8-9	8-9
107													
1-2	1-2	1-9	2-3	3-4	3-6	3-7	4-5	4-6	5-6	5-9	7-8	7-8	8-9
108													
1-2	1-2	1-9	2-3	2-6	3-4	3-5	4-5	4-9	5-6	6-7	7-8	7-8	8-9
109													
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110													
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111													
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112													
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113													
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114													
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115													
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116													
1-2	1-2	1-9	2-3	2-8	3-4	3-7	4-5	4-9	5-6	5-6	6-7	7-8	8-9
117													
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118													
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119													
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120													
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121													
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122													
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123													
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124													
1-2	1-2	1-3	2-3	3-4	3-9	4-5	4-7	5-6	5-9	6-7	6-8	7-8	8-9
125													
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126													
1-2	1-2	1-9	2-3	3-4	3-9	4-5	4-7	5-6	5-6	5-8	6-7	7-8	8-9
127													
1-2	1-2	1-3	2-3	3-4	3-9	4-5	4-8	5-6	5-9	6-7	6-7	7-8	8-9
128													

1-2	1-2	1-3	1-9	2-3	3-4	4-5	4-8	5-6	5-9	6-7	6-7	7-8	8-9
129													
1-2	1-2	1-3	2-3	3-4	3-9	4-5	4-9	5-6	5-7	6-7	6-8	7-8	8-9
130													
1-2	1-2	1-9	2-3	3-4	3-9	4-5	4-8	4-9	5-6	5-7	6-7	6-8	7-8
131													
1-2	1-2	1-3	1-9	2-3	3-4	4-5	4-9	5-6	5-7	6-7	6-8	7-8	8-9
132													
1-2	1-2	1-9	2-3	3-4	3-9	4-5	4-8	4-9	5-6	5-8	6-7	6-7	7-8
133													
1-2	1-2	1-3	2-3	3-4	3-9	4-5	4-9	5-6	5-8	6-7	6-7	7-8	8-9
134													
1-2	1-2	1-3	1-9	2-3	3-4	4-5	4-9	5-6	5-8	6-7	6-7	7-8	8-9
135													
1-2	1-3	1-9	2-3	2-4	3-4	4-5	5-6	5-7	6-7	6-8	6-9	7-8	8-9
136													
1-2	1-3	1-9	2-3	2-4	3-4	4-5	5-6	5-7	5-8	6-7	6-9	7-8	8-9
137													
1-2	1-3	1-9	2-3	2-4	3-4	4-5	5-6	5-7	5-9	6-7	6-8	7-8	8-9
138													
1-2	1-3	1-5	2-3	2-4	3-4	4-5	5-6	5-9	6-7	6-8	7-8	7-9	8-9
139													
1-2	1-7	1-7	1-8	2-3	2-3	3-4	4-5	4-9	5-6	5-6	6-7	8-9	8-9
140													
1-2	1-2	1-7	1-8	2-3	3-4	3-9	4-5	4-5	5-6	6-7	6-7	8-9	8-9
141													
1-2	1-7	1-8	2-3	2-3	3-4	4-5	4-9	5-6	5-6	6-7	6-7	8-9	8-9
142													
1-2	1-2	1-7	1-8	2-3	3-4	3-9	4-5	4-6	5-6	5-7	6-7	8-9	8-9
143													
1-2	1-7	1-8	2-3	2-3	3-4	4-5	4-9	5-6	5-6	5-7	6-7	8-9	8-9
144													
1-2	1-5	1-8	2-3	2-3	3-4	4-5	4-9	5-6	5-7	6-7	6-7	8-9	8-9
145													
1-2	1-2	1-7	1-8	2-3	3-4	3-9	4-5	4-7	5-6	5-6	6-7	8-9	8-9
146													
1-2	1-4	1-7	2-3	2-3	2-8	3-4	4-5	5-6	5-6	6-7	7-9	8-9	8-9
147													
1-2	1-7	1-8	2-3	2-7	3-4	3-4	4-5	4-9	5-6	5-6	6-7	8-9	8-9
148													
1-2	1-8	1-9	1-9	2-3	2-8	3-4	3-4	4-5	5-6	5-9	6-7	6-7	7-8
149													
1-2	1-2	1-9	2-3	2-3	3-4	4-5	4-7	5-6	5-8	6-7	6-9	7-8	8-9
150													
1-2	1-2	1-7	1-9	2-3	3-4	3-4	4-5	5-6	5-8	6-7	6-9	7-8	8-9
151													
1-2	1-2	1-9	2-3	3-4	3-5	4-5	4-7	4-8	5-6	6-7	6-8	7-9	8-9
152													
1-2	1-2	1-9	2-3	2-4	3-4	3-7	4-5	5-6	5-8	6-7	6-9	7-8	8-9
153													
1-2	1-2	1-7	1-9	2-3	3-4	3-5	4-5	4-8	5-6	6-7	6-9	7-8	8-9
154													

1-2	1-2	1-9	2-3	2-5	3-4	3-6	4-5	4-9	5-6	6-7	7-8	7-8	8-9
155													
1-2	1-2	1-5	1-9	2-3	3-4	3-6	4-5	4-7	5-6	6-7	7-8	8-9	8-9
156													
1-2	1-2	1-9	2-3	3-4	3-6	4-5	4-7	4-8	5-6	5-8	6-7	7-9	8-9
157													
1-2	1-2	1-9	2-3	3-4	3-6	4-5	4-7	5-6	5-8	6-7	6-9	7-8	8-9
158													
1-2	1-2	1-9	2-3	3-4	3-7	3-7	4-5	4-8	5-6	6-7	6-9	7-8	8-9
159													
1-2	1-2	1-7	1-9	2-3	3-4	3-6	4-5	4-8	5-6	5-9	6-7	7-8	8-9
160													
1-2	1-2	1-9	2-3	2-5	3-4	3-7	4-5	4-9	5-6	6-7	6-8	7-8	8-9
161													
1-2	1-2	1-5	1-9	2-3	3-4	3-6	4-5	4-8	5-6	6-7	7-8	7-9	8-9
162													
1-2	1-2	1-5	1-9	2-3	3-4	3-6	4-5	4-9	5-6	6-7	7-8	7-8	8-9
163													
1-2	1-2	1-9	2-3	3-4	3-6	3-8	4-5	4-7	5-6	5-9	6-7	7-8	8-9
164													
1-2	1-2	1-6	1-9	2-3	3-4	3-7	4-5	4-9	5-6	5-8	6-7	7-8	8-9
165													
1-2	1-2	1-9	2-3	3-4	3-6	3-9	4-5	4-7	5-6	5-8	6-7	7-8	8-9
166													
1-2	1-2	1-4	1-9	2-3	3-4	3-7	4-5	5-6	5-8	6-7	6-9	7-8	8-9
167													
1-2	1-2	1-3	2-3	3-4	3-9	4-5	4-7	5-6	5-8	6-7	6-9	7-8	8-9
168													
1-2	1-2	1-3	1-9	2-3	3-4	4-5	4-7	5-6	5-8	6-7	6-9	7-8	8-9
169													
1-2	1-3	1-7	1-9	2-3	2-4	3-4	4-5	5-6	5-8	6-7	6-9	7-8	8-9
170													
1-2	1-3	1-9	2-3	2-5	3-4	4-5	4-7	4-8	5-6	6-7	6-8	7-9	8-9
171													
1-2	1-3	1-9	2-3	2-4	2-5	3-4	4-7	5-6	5-8	6-7	6-9	7-8	8-9
172													
1-2	1-3	1-7	1-9	2-3	2-5	3-4	4-5	4-8	5-6	6-7	6-9	7-8	8-9
173													
1-2	1-3	1-9	2-3	2-5	2-6	3-4	4-5	4-6	5-8	6-7	7-8	7-9	8-9
174													
1-2	1-3	1-8	1-9	2-3	2-6	3-4	4-5	4-7	5-6	5-9	6-7	7-8	8-9
175													
1-2	1-3	1-9	2-3	2-6	3-4	4-5	4-7	4-8	5-6	5-8	6-7	7-9	8-9
176													
1-2	1-3	1-9	2-3	2-5	2-6	3-4	4-5	4-7	5-8	6-7	6-9	7-8	8-9
177													
1-2	1-3	1-7	1-9	2-3	2-6	3-4	4-5	4-8	5-6	5-9	6-7	7-8	8-9
178													
1-2	1-4	1-7	1-9	2-3	2-5	3-4	3-8	4-5	5-6	6-7	6-9	7-8	8-9
179													
1-2	1-4	1-9	2-3	2-5	2-6	3-4	3-7	4-5	5-8	6-7	6-9	7-8	8-9
180													

1-2 1-4 1-7 1-9 2-3 2-6 3-4 3-8 4-5 5-6 5-9 6-7 7-8 8-9

CATALOG22 (4 Entries)

1						
1-2	1-3	1-4	2-3	2-4	3-4	3-4
2						
1-2	1-2	1-4	2-3	3-4	3-4	3-4
3						
1-2	1-2	1-4	2-3	2-4	3-4	3-4
4						
1-2	1-2	1-4	1-4	2-3	3-4	3-4

CATALOG42 (34 Entries)

1										
1-2	1-4	1-6	2-3	2-5	3-4	3-6	4-5	5-6	5-6	
2										
1-2	1-3	1-4	1-6	2-3	2-4	3-4	4-5	5-6	5-6	
3										
1-2	1-4	1-6	2-3	2-6	3-4	3-5	4-5	5-6	5-6	
4										
1-2	1-3	1-6	2-3	2-4	3-5	4-5	4-6	5-6	5-6	
5										
1-2	1-4	1-6	2-3	2-4	3-4	3-5	4-6	5-6	5-6	
6										
1-2	1-3	1-6	2-3	2-4	3-4	4-5	4-6	5-6	5-6	
7										
1-2	1-4	1-6	2-3	2-4	3-4	3-6	4-5	5-6	5-6	
8										
1-3	1-5	1-6	2-3	2-5	2-6	3-4	4-5	4-6	5-6	
9										
1-2	1-3	1-6	2-3	2-6	3-4	3-5	4-5	4-6	5-6	
10										
1-2	1-3	1-6	2-5	2-6	3-4	3-5	4-5	4-6	5-6	
11										
1-2	1-3	1-4	2-3	2-3	3-4	4-5	4-6	5-6	5-6	
12										
1-2	1-5	1-6	2-3	2-4	3-4	3-4	4-5	5-6	5-6	
13										
1-2	1-3	1-6	2-3	2-3	3-4	4-5	4-6	5-6	5-6	
14										
1-2	1-2	1-4	2-3	3-4	3-5	4-5	4-6	5-6	5-6	
15										
1-2	1-3	1-6	2-3	2-4	3-4	3-4	4-5	5-6	5-6	
16										
1-2	1-3	1-6	2-3	2-3	2-4	3-4	4-5	5-6	5-6	
17										
1-2	1-3	1-6	2-3	2-4	3-4	4-5	4-5	5-6	5-6	
18										
1-2	1-2	1-6	2-3	2-4	3-4	3-5	4-5	5-6	5-6	
19										
1-2	1-2	1-4	2-3	2-6	3-4	3-5	4-6	5-6	5-6	
20										
1-2	1-2	1-6	2-3	2-4	3-4	3-6	4-5	5-6	5-6	
21										
1-2	1-2	1-4	2-3	2-6	3-4	3-6	4-5	5-6	5-6	
22										
1-2	1-3	1-6	2-3	2-4	3-4	4-5	5-6	5-6	5-6	
23										
1-2	1-6	1-6	2-3	2-3	3-4	4-5	4-5	5-6	5-6	
24										

1-2	1-6	1-6	2-3	2-3	3-4	3-4	4-5	5-6	5-6
25									
1-2	1-2	1-3	2-3	3-4	3-4	4-5	4-6	5-6	5-6
26									
1-2	1-2	1-3	2-4	3-4	3-4	3-6	4-5	5-6	5-6
27									
1-2	1-2	1-4	2-3	2-6	3-4	3-4	4-5	5-6	5-6
28									
1-2	1-2	1-3	2-3	3-4	3-6	4-5	4-5	5-6	5-6
29									
1-2	1-2	1-6	2-3	3-4	3-4	3-6	4-5	5-6	5-6
30									
1-2	1-2	1-6	2-3	3-4	3-6	4-5	4-5	5-6	5-6
31									
1-2	1-3	1-6	2-3	2-3	3-4	4-5	4-5	5-6	5-6
32									
1-2	1-2	1-6	2-3	2-6	3-4	3-4	4-5	5-6	5-6
33									
1-2	1-4	1-6	2-3	2-3	2-3	3-4	4-5	5-6	5-6
34									
1-2	1-2	1-2	1-6	2-3	3-4	3-4	4-5	5-6	5-6

CATALOG62 (297 Entries)

1												
1-2	1-3	1-8	2-3	2-4	3-5	4-5	4-5	4-7	5-6	6-7	6-8	7-8
2												
1-2	1-3	1-8	2-3	2-4	3-4	4-5	4-5	5-6	5-7	6-7	6-8	7-8
3												
1-2	1-3	1-8	2-3	2-4	3-5	4-5	4-7	5-6	5-7	6-7	6-8	7-8
4												
1-2	1-3	1-8	2-3	2-5	3-4	4-5	4-6	5-7	6-7	6-7	6-8	7-8
5												
1-2	1-3	1-8	2-3	2-4	3-4	4-5	4-7	5-6	5-7	6-7	6-8	7-8
6												
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7												
1-2	1-4	1-8	2-3	2-4	3-4	3-5	4-7	5-6	5-7	6-7	6-8	7-8
8												
1-2	1-3	1-8	2-5	2-8	3-4	3-5	4-5	4-7	5-6	6-7	6-8	7-8
9												
1-2	1-4	1-8	2-3	2-8	3-4	3-5	4-5	5-6	5-7	6-7	6-8	7-8
10												
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11												
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12												
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13												
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14												
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15												
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16												
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17												
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18												
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19												
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20												
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21												
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22												
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23												
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25												
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26												
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27												
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28												
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31												
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37												
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46												
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52												
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54												
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67												
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69												
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72												
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73												
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74												
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75												
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77												
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78												
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79												
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80												
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81												
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82												
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83												
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84												
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85												
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106												
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126												
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129												
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132												
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133												
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274												
1-2	1-5	1-8	2-3	2-6	3-4	3-8	4-5	4-6	5-6	6-7	7-8	7-8
275												
1-2	1-5	1-8	2-3	2-6	3-4	3-8	4-5	4-7	5-6	6-7	7-8	7-8
276												
1-2	1-3	1-8	2-3	2-6	3-4	4-5	4-7	5-6	5-8	6-7	7-8	7-8
277												
1-2	1-5	1-8	2-3	2-6	3-4	3-4	4-5	4-7	5-6	6-7	7-8	7-8
278												
1-2	1-5	1-8	2-3	2-3	3-4	3-6	4-5	4-8	5-6	6-7	7-8	7-8
279												
1-2	1-3	1-5	2-4	2-6	3-4	3-6	3-8	4-5	5-6	6-7	7-8	7-8
280												
1-2	1-4	1-6	2-3	2-5	3-4	3-6	4-5	4-8	5-6	6-7	7-8	7-8
281												
1-2	1-6	1-8	2-3	2-5	3-4	3-6	4-5	4-8	5-6	6-7	7-8	7-8
282												
1-2	1-6	1-8	2-3	2-5	3-4	3-7	4-5	4-8	5-6	6-7	7-8	7-8
283												
1-2	1-4	1-8	2-3	2-5	3-4	3-6	4-5	5-6	6-7	6-8	7-8	7-8
284												

1-2	1-4	1-8	2-3	2-5	3-4	3-7	4-5	5-6	6-7	6-8	7-8	7-8
285												
1-2	1-4	1-8	2-3	2-5	3-4	3-6	4-5	5-6	6-7	7-8	7-8	7-8
286												
1-2	1-4	1-8	2-3	2-5	3-4	3-8	4-5	5-6	5-7	6-7	6-8	7-8
287												
1-2	1-3	1-8	2-4	2-5	3-4	3-5	4-5	4-7	5-6	6-7	6-8	7-8
288												
1-2	1-3	1-8	2-4	2-5	3-4	3-5	4-7	5-6	5-7	6-7	6-8	7-8
289												
1-3	1-5	1-8	2-3	2-5	2-8	3-4	4-5	4-7	5-6	6-7	6-8	7-8
290												
1-2	1-3	1-8	2-3	2-5	3-4	4-6	4-7	5-6	5-7	6-7	6-8	7-8
291												
1-2	1-4	1-8	2-3	2-4	3-5	3-7	4-5	4-7	5-6	6-7	6-8	7-8
292												
1-2	1-4	1-8	2-3	2-8	3-5	3-7	4-5	4-7	5-6	6-7	6-8	7-8
293												
1-2	1-3	1-8	2-4	2-5	3-5	3-7	4-5	4-7	5-6	6-7	6-8	7-8
294												
1-2	1-5	1-8	2-3	2-6	3-4	3-8	4-5	4-7	5-6	6-7	6-8	7-8
295												
1-2	1-4	1-8	2-3	2-5	3-7	3-8	4-5	4-7	5-6	6-7	6-8	7-8
296												
1-3	1-6	1-8	2-3	2-6	2-8	3-4	4-5	4-7	5-6	5-8	6-7	7-8
297												
1-3	1-4	1-8	2-3	2-4	2-6	3-7	4-5	4-7	5-6	5-8	6-7	7-8

CATALOG23 (1 Entry)

1

1-2 1-2 1-3 1-3 2-3 2-3

CATALOG23 (12 Entries)

1								
1-2	1-2	1-3	2-3	3-4	3-5	4-5	4-5	4-5
2								
1-2	1-2	1-3	1-5	2-3	3-4	4-5	4-5	4-5
3								
1-2	1-2	1-3	1-5	2-3	2-3	3-4	4-5	4-5
4								
1-2	1-2	1-5	2-3	2-3	3-4	4-5	4-5	4-5
5								
1-2	1-2	1-5	2-3	2-4	3-4	3-4	3-5	4-5
6								
1-2	1-3	1-4	1-5	2-3	2-3	2-4	3-5	4-5
7								
1-2	1-3	1-4	1-5	2-3	2-4	2-5	3-4	4-5
8								
1-2	1-2	1-4	1-5	2-3	2-3	3-4	3-5	4-5
9								
1-2	1-2	1-5	2-3	2-3	3-4	3-4	4-5	4-5
10								
1-2	1-2	1-3	1-5	2-3	2-4	3-4	4-5	4-5
11								
1-2	1-2	1-3	1-4	2-3	3-4	3-5	4-5	4-5
12								
1-2	1-2	1-3	1-5	2-3	3-4	3-4	4-5	4-5

CATALOG43 (186 Entries)

1											
1-2	1-3	1-7	2-3	2-3	2-4	3-4	4-5	4-6	5-6	5-7	6-7
2											
1-2	1-3	1-7	2-3	2-4	2-5	3-4	4-5	4-6	5-6	5-7	6-7
3											
1-2	1-3	1-7	2-3	2-3	2-4	3-5	4-5	4-6	4-7	5-6	6-7
4											
1-2	1-3	1-6	1-7	2-3	2-5	3-4	4-5	4-5	4-6	5-7	6-7
5											
1-2	1-3	1-6	1-7	2-3	2-4	3-4	4-5	4-5	5-6	5-7	6-7
6											
1-2	1-3	1-6	1-7	2-3	2-4	2-5	3-4	4-5	4-6	5-7	6-7
7											
1-2	1-3	1-6	1-7	2-3	2-3	2-4	3-5	4-5	4-7	5-6	6-7
8											
1-2	1-3	1-6	1-7	2-3	2-4	2-5	3-4	4-5	5-6	5-7	6-7
9											
1-2	1-3	1-5	1-7	2-3	2-4	3-4	3-6	4-5	5-6	5-7	6-7
10											
1-2	1-2	1-7	2-3	3-4	3-5	4-5	4-6	4-7	5-6	5-7	6-7
11											
1-2	1-3	1-4	2-3	2-3	2-4	3-6	4-5	4-7	5-6	5-7	6-7
12											
1-2	1-3	1-4	1-7	2-3	2-4	3-4	3-6	4-5	5-6	5-7	6-7
13											
1-2	1-3	1-4	1-7	2-3	2-3	2-4	3-6	4-5	5-6	5-7	6-7
14											
1-2	1-2	1-6	2-3	3-4	3-5	3-7	4-5	4-6	4-7	5-6	6-7
15											
1-2	1-3	1-7	2-3	2-3	2-4	3-6	4-5	4-7	5-6	5-7	6-7
16											
1-2	1-3	1-6	1-7	2-3	2-5	2-6	3-4	4-5	4-7	5-6	6-7
17											
1-2	1-3	1-7	2-3	2-6	3-4	4-5	4-5	4-7	5-6	5-6	6-7
18											
1-2	1-3	1-7	2-3	2-5	2-6	3-4	4-5	4-5	4-7	5-6	6-7
19											
1-2	1-3	1-4	1-7	2-3	2-6	3-4	4-5	4-5	5-6	5-7	6-7
20											
1-2	1-2	1-3	1-3	2-5	2-6	3-4	3-7	4-5	4-7	5-6	6-7
21											
1-2	1-2	1-7	1-7	2-3	2-3	3-4	3-4	4-5	5-6	5-6	6-7
22											
1-2	1-2	1-7	1-7	2-3	2-3	3-4	4-5	4-5	5-6	5-6	6-7
23											
1-2	1-2	1-6	1-7	2-3	2-3	3-4	3-4	4-5	5-6	5-7	6-7
24											

1-2	1-2	1-6	1-7	2-3	2-3	3-4	4-5	4-5	5-6	5-7	6-7
25											
1-2	1-2	1-7	2-3	2-3	3-4	3-4	4-5	5-6	5-6	5-7	6-7
26											
1-2	1-2	1-5	2-3	2-3	3-4	3-4	4-5	5-6	5-7	6-7	6-7
27											
1-2	1-2	1-6	1-7	2-3	3-4	3-4	4-5	4-5	5-6	6-7	6-7
28											
1-2	1-2	1-5	1-7	2-3	2-3	3-4	4-5	4-5	5-6	6-7	6-7
29											
1-2	1-2	1-5	1-7	2-3	2-3	3-4	3-4	4-5	5-6	6-7	6-7
30											
1-2	1-2	1-6	1-7	2-3	2-3	3-4	4-5	4-5	5-6	6-7	6-7
31											
1-2	1-2	1-7	2-3	2-3	3-4	4-5	4-5	5-6	6-7	6-7	6-7
32											
1-2	1-2	1-5	1-7	2-3	3-4	3-4	4-5	4-6	5-6	5-7	6-7
33											
1-2	1-2	1-5	1-7	2-3	2-3	3-4	4-5	4-6	5-6	5-7	6-7
34											
1-2	1-2	1-7	2-3	2-3	3-4	4-5	4-6	5-6	5-6	5-7	6-7
35											
1-2	1-2	1-6	1-7	2-3	3-4	3-4	4-5	5-6	5-7	6-7	6-7
36											
1-2	1-2	1-4	1-7	2-3	2-3	3-4	3-5	4-5	5-6	6-7	6-7
37											
1-2	1-2	1-4	2-3	2-3	3-4	3-5	4-5	4-7	5-6	6-7	6-7
38											
1-2	1-2	1-5	1-7	2-3	2-3	3-4	4-5	4-6	5-6	6-7	6-7
39											
1-2	1-2	1-5	1-7	2-3	3-4	3-4	4-5	4-6	5-6	6-7	6-7
40											
1-2	1-2	1-7	2-3	2-3	3-4	3-5	4-5	4-7	5-6	5-6	6-7
41											
1-2	1-2	1-5	2-3	2-3	3-4	4-5	4-6	5-6	5-7	6-7	6-7
42											
1-2	1-2	1-5	2-3	3-4	3-4	4-5	4-6	5-6	5-7	6-7	6-7
43											
1-2	1-2	1-7	2-3	2-3	3-4	3-5	4-5	4-7	5-6	6-7	6-7
44											
1-2	1-2	1-7	2-3	2-3	3-4	4-5	4-6	5-6	5-7	6-7	6-7
45											
1-2	1-2	1-7	2-3	3-4	3-4	4-5	4-6	5-6	5-7	6-7	6-7
46											
1-2	1-2	1-5	2-3	2-3	3-4	4-5	4-6	4-7	5-6	5-7	6-7
47											
1-2	1-2	1-4	1-7	2-3	2-3	3-4	4-5	4-6	5-6	5-7	6-7
48											
1-2	1-2	1-5	1-7	2-3	2-3	3-4	4-5	4-6	4-7	5-6	6-7
49											
1-2	1-2	1-7	2-3	3-4	3-4	4-5	5-6	5-6	5-7	6-7	6-7
50											

1-2	1-2	1-5	2-3	2-3	3-4	4-5	4-5	4-7	5-6	6-7	6-7
51											
1-2	1-2	1-5	1-7	2-3	3-4	3-4	4-5	4-7	5-6	5-6	6-7
52											
1-2	1-2	1-5	1-7	2-3	2-3	3-4	4-5	4-7	5-6	5-6	6-7
53											
1-2	1-2	1-4	1-7	2-3	2-3	3-4	3-7	4-5	5-6	5-6	6-7
54											
1-2	1-2	1-4	2-3	2-3	3-4	4-5	4-7	5-6	5-6	6-7	6-7
55											
1-2	1-2	1-4	1-7	2-3	2-3	3-4	4-5	4-5	5-6	6-7	6-7
56											
1-2	1-2	1-4	1-7	2-3	3-4	3-4	4-5	5-6	5-6	6-7	6-7
57											
1-2	1-2	1-4	1-7	2-3	2-3	3-4	4-5	5-6	5-6	6-7	6-7
58											
1-2	1-2	1-3	1-7	2-3	2-3	3-4	4-5	4-6	5-6	5-7	6-7
59											
1-2	1-2	1-4	2-3	2-3	3-4	4-5	4-7	5-6	5-6	5-7	6-7
60											
1-2	1-2	1-7	2-3	2-3	3-4	3-7	4-5	4-5	4-6	5-6	6-7
61											
1-2	1-2	1-4	2-3	2-3	3-4	4-5	4-5	5-6	5-7	6-7	6-7
62											
1-2	1-2	1-5	2-3	3-4	3-4	4-5	5-6	5-7	6-7	6-7	6-7
63											
1-2	1-2	1-7	2-3	2-3	3-4	4-5	4-7	5-6	5-6	5-6	6-7
64											
1-2	1-2	1-4	1-7	2-3	3-4	3-4	4-5	5-6	5-6	5-7	6-7
65											
1-2	1-2	1-4	1-5	2-3	3-4	3-4	4-5	5-6	5-7	6-7	6-7
66											
1-2	1-2	1-4	1-7	2-3	2-3	3-4	4-5	5-6	5-6	5-7	6-7
67											
1-2	1-2	1-3	1-7	2-3	2-3	3-4	4-5	4-7	5-6	5-6	6-7
68											
1-2	1-2	1-4	1-5	2-3	2-3	3-4	4-5	5-6	5-7	6-7	6-7
69											
1-2	1-2	1-5	1-7	2-3	3-4	3-4	4-5	5-6	6-7	6-7	6-7
70											
1-2	1-2	1-5	1-7	2-3	2-4	3-4	3-5	4-5	5-6	6-7	6-7
71											
1-2	1-2	1-6	1-7	2-3	2-4	3-4	3-5	4-5	5-6	6-7	6-7
72											
1-2	1-2	1-7	2-3	2-4	3-4	3-5	4-5	5-6	5-7	6-7	6-7
73											
1-2	1-2	1-7	2-3	2-4	3-4	3-5	4-5	5-6	6-7	6-7	6-7
74											
1-2	1-2	1-7	2-3	2-4	3-4	3-4	3-5	4-6	5-6	5-7	6-7
75											
1-2	1-2	1-6	1-7	2-3	3-4	3-5	4-5	4-5	4-6	5-7	6-7
76											

1-2	1-2	1-6	1-7	2-3	3-4	3-5	4-5	4-6	4-7	5-6	6-7
77											
1-2	1-2	1-5	1-7	2-3	2-4	3-4	3-5	3-6	4-5	6-7	6-7
78											
1-2	1-2	1-4	1-7	2-3	2-4	3-4	3-5	4-5	5-6	6-7	6-7
79											
1-2	1-2	1-5	1-7	2-3	3-4	3-5	4-5	4-5	4-6	6-7	6-7
80											
1-2	1-2	1-7	2-3	2-4	3-4	3-4	3-5	4-7	5-6	5-6	6-7
81											
1-2	1-2	1-4	1-7	2-3	3-4	3-6	4-5	5-6	5-6	5-7	6-7
82											
1-2	1-2	1-5	2-3	2-4	3-4	3-5	3-6	4-5	5-7	6-7	6-7
83											
1-2	1-2	1-5	1-7	2-3	2-4	3-4	3-6	4-5	5-6	6-7	6-7
84											
1-2	1-2	1-5	1-7	2-3	3-4	3-5	4-5	4-6	5-6	6-7	6-7
85											
1-2	1-2	1-7	2-3	2-4	3-4	3-5	4-5	4-7	5-6	5-6	6-7
86											
1-2	1-2	1-5	2-3	2-4	3-4	3-6	4-5	5-6	5-7	6-7	6-7
87											
1-2	1-2	1-7	2-3	2-4	3-4	3-5	3-6	4-5	5-7	6-7	6-7
88											
1-2	1-2	1-7	2-3	3-4	3-5	4-5	4-5	4-6	5-7	6-7	6-7
89											
1-2	1-2	1-7	2-3	2-4	3-4	3-6	4-5	5-6	5-7	6-7	6-7
90											
1-2	1-2	1-5	1-7	2-3	3-4	3-5	4-5	4-6	4-7	5-6	6-7
91											
1-2	1-2	1-7	2-3	2-4	3-4	3-5	3-6	4-5	4-7	5-6	6-7
92											
1-2	1-2	1-6	1-7	2-3	3-4	3-5	4-5	4-6	4-7	5-6	5-7
93											
1-2	1-2	1-5	2-3	2-4	3-4	3-6	3-7	4-5	5-6	5-7	6-7
94											
1-2	1-2	1-7	2-3	2-4	3-4	3-6	3-7	4-5	5-6	5-7	6-7
95											
1-2	1-2	1-7	2-3	2-4	3-4	3-6	3-7	4-5	4-5	5-6	6-7
96											
1-2	1-2	1-3	1-7	2-3	2-4	3-4	3-7	4-5	5-6	5-6	6-7
97											
1-2	1-2	1-4	1-7	2-3	3-4	3-5	4-5	4-7	5-6	5-6	6-7
98											
1-2	1-2	1-6	1-7	2-3	2-4	3-4	3-7	4-5	4-5	5-6	6-7
99											
1-2	1-2	1-7	2-3	2-4	3-4	3-6	3-7	4-5	4-7	5-6	5-6
100											
1-2	1-2	1-7	2-3	2-4	3-4	3-6	3-7	4-5	5-6	5-6	5-7
101											
1-2	1-2	1-4	1-6	2-3	3-4	3-5	4-5	4-7	5-6	6-7	6-7
102											

1-2	1-2	1-5	1-7	2-3	2-4	3-4	3-7	4-5	5-6	5-6	6-7
103											
1-2	1-2	1-3	1-5	2-3	2-4	3-4	3-7	4-5	5-6	6-7	6-7
104											
1-2	1-2	1-3	2-3	2-4	3-4	3-7	4-5	4-6	5-6	5-7	6-7
105											
1-2	1-2	1-3	1-7	2-3	2-4	3-4	4-5	4-7	5-6	5-6	6-7
106											
1-2	1-2	1-3	2-3	2-4	3-4	3-7	4-5	4-7	5-6	5-6	6-7
107											
1-2	1-2	1-3	1-7	2-3	2-4	3-4	4-5	5-6	5-6	5-7	6-7
108											
1-2	1-2	1-3	2-3	2-4	3-4	3-7	4-5	5-6	5-6	5-7	6-7
109											
1-2	1-2	1-3	1-5	2-3	2-4	3-4	4-5	5-6	5-7	6-7	6-7
110											
1-2	1-2	1-3	1-7	2-3	3-4	4-5	4-6	5-6	5-6	5-7	6-7
111											
1-2	1-2	1-3	2-3	2-4	3-4	3-5	4-5	5-6	5-7	6-7	6-7
112											
1-2	1-2	1-3	1-7	2-3	2-4	3-4	4-5	5-6	5-7	6-7	6-7
113											
1-2	1-2	1-3	2-3	2-4	3-4	3-7	4-5	5-6	5-7	6-7	6-7
114											
1-2	1-2	1-4	1-7	2-3	3-4	3-5	4-5	5-6	5-7	6-7	6-7
115											
1-2	1-2	1-7	2-3	2-4	3-4	3-7	4-5	4-6	5-6	5-6	6-7
116											
1-2	1-2	1-4	1-7	2-3	3-4	3-5	4-5	5-6	6-7	6-7	6-7
117											
1-2	1-2	1-7	2-3	2-4	3-4	3-7	4-5	5-6	5-6	5-6	6-7
118											
1-2	1-2	1-4	2-3	3-4	3-5	4-5	4-7	5-6	6-7	6-7	6-7
119											
1-2	1-2	1-7	2-3	3-4	3-4	3-4	4-5	5-6	5-6	5-7	6-7
120											
1-2	1-2	1-5	2-3	3-4	3-4	3-4	4-5	5-6	5-7	6-7	6-7
121											
1-2	1-2	1-5	1-7	2-3	3-4	3-4	3-4	4-5	5-6	6-7	6-7
122											
1-2	1-2	1-5	1-7	2-3	3-4	3-4	3-5	4-5	5-6	6-7	6-7
123											
1-2	1-2	1-6	1-7	2-3	3-4	3-5	4-5	4-5	5-6	6-7	6-7
124											
1-2	1-2	1-6	1-7	2-3	3-4	3-5	3-6	4-5	4-5	6-7	6-7
125											
1-2	1-2	1-6	1-7	2-3	3-4	3-4	3-5	4-5	5-6	6-7	6-7
126											
1-2	1-2	1-5	1-7	2-3	2-4	3-4	3-4	4-5	5-6	6-7	6-7
127											
1-2	1-2	1-5	1-7	2-3	2-5	3-4	3-4	4-5	5-6	6-7	6-7
128											

1-2	1-2	1-7	2-3	3-4	3-4	3-4	4-5	5-6	5-7	6-7	6-7
129											
1-2	1-2	1-7	2-3	3-4	3-4	3-5	4-5	5-6	5-7	6-7	6-7
130											
1-2	1-2	1-6	2-3	3-4	3-5	3-6	4-5	4-6	4-7	5-7	6-7
131											
1-2	1-2	1-4	1-6	2-3	3-4	3-6	4-5	4-7	5-6	5-7	6-7
132											
1-2	1-2	1-4	1-6	2-3	3-4	3-5	3-6	4-5	4-7	5-7	6-7
133											
1-2	1-2	1-6	1-7	2-3	3-4	3-5	3-7	4-5	4-6	4-7	5-6
134											
1-2	1-2	1-4	1-7	2-3	3-4	3-4	3-5	4-6	5-6	5-7	6-7
135											
1-2	1-2	1-3	1-7	2-3	3-4	3-5	4-5	4-6	4-7	5-6	6-7
136											
1-2	1-2	1-3	2-3	2-5	3-4	3-7	4-5	4-6	5-6	5-7	6-7
137											
1-2	1-2	1-7	2-3	2-5	3-4	3-7	4-5	4-5	4-6	5-6	6-7
138											
1-2	1-2	1-7	2-3	3-4	3-5	3-7	4-5	4-5	4-6	5-6	6-7
139											
1-2	1-2	1-4	1-7	2-3	3-4	3-4	3-5	4-7	5-6	5-6	6-7
140											
1-2	1-2	1-3	1-7	2-3	2-5	3-4	4-5	4-7	5-6	5-6	6-7
141											
1-2	1-2	1-4	1-7	2-3	3-4	3-5	3-6	4-5	5-7	6-7	6-7
142											
1-2	1-2	1-7	2-3	3-4	3-4	3-5	4-7	4-7	5-6	5-6	6-7
143											
1-2	1-2	1-5	2-3	3-4	3-4	3-6	4-5	5-6	5-7	6-7	6-7
144											
1-2	1-2	1-4	1-7	2-3	2-5	3-4	3-4	4-5	5-6	6-7	6-7
145											
1-2	1-2	1-5	1-7	2-3	3-4	3-6	4-5	4-5	5-6	6-7	6-7
146											
1-2	1-2	1-5	1-7	2-3	3-4	3-4	3-6	4-5	5-6	6-7	6-7
147											
1-2	1-2	1-4	1-7	2-3	3-4	3-5	3-5	4-5	5-6	6-7	6-7
148											
1-2	1-2	1-7	2-3	2-6	3-4	3-5	3-7	4-5	4-5	5-6	6-7
149											
1-2	1-2	1-4	2-3	2-7	3-4	3-6	4-5	4-7	5-6	5-6	6-7
150											
1-2	1-2	1-3	2-3	3-4	3-7	4-5	4-6	5-6	5-6	5-7	6-7
151											
1-2	1-2	1-2	1-7	2-3	3-4	3-5	4-5	4-6	4-7	5-6	6-7
152											
1-2	1-2	1-3	2-3	3-4	3-5	4-5	4-6	4-7	5-6	5-7	6-7
153											
1-2	1-2	1-7	2-3	2-7	3-4	3-5	3-6	4-5	4-6	4-7	5-6
154											

1-2	1-2	1-2	1-7	2-3	3-4	3-5	3-7	4-5	4-6	5-6	6-7
155											
1-2	1-2	1-2	1-7	2-3	3-4	3-5	3-6	4-5	4-7	5-6	6-7
156											
1-2	1-2	1-3	2-3	3-4	3-5	4-5	4-5	4-7	5-6	6-7	6-7
157											
1-2	1-2	1-3	1-5	2-3	3-4	4-5	4-5	4-7	5-6	6-7	6-7
158											
1-2	1-2	1-2	1-7	2-3	3-4	3-6	4-5	4-5	4-7	5-6	6-7
159											
1-2	1-2	1-2	1-3	2-3	3-4	3-7	4-5	4-6	5-6	5-7	6-7
160											
1-2	1-2	1-3	2-3	3-4	3-4	4-5	4-7	5-6	5-6	5-7	6-7
161											
1-2	1-2	1-3	2-3	3-4	3-4	4-5	4-5	5-6	5-7	6-7	6-7
162											
1-2	1-2	1-7	2-3	2-7	3-4	3-6	3-7	4-5	4-5	4-6	5-6
163											
1-2	1-2	1-2	1-3	2-3	3-4	3-7	4-5	4-7	5-6	5-6	6-7
164											
1-2	1-2	1-2	1-7	2-3	3-4	3-7	4-5	4-5	4-6	5-6	6-7
165											
1-2	1-2	1-2	1-7	2-3	3-4	3-7	4-5	4-6	4-7	5-6	5-6
166											
1-2	1-2	1-5	1-7	2-3	2-3	3-4	3-6	4-5	4-7	5-6	6-7
167											
1-2	1-2	1-7	2-3	2-4	3-4	3-5	3-6	4-5	4-6	5-7	6-7
168											
1-2	1-2	1-6	1-7	2-3	2-4	3-4	3-6	3-7	4-5	5-6	5-7
169											
1-2	1-2	1-4	1-7	2-3	2-5	3-4	3-6	4-5	5-6	6-7	6-7
170											
1-2	1-2	1-5	1-7	2-3	3-4	3-6	4-5	4-5	4-7	5-6	6-7
171											
1-2	1-2	1-4	1-6	2-3	3-4	3-5	3-7	4-5	4-7	5-6	6-7
172											
1-2	1-2	1-6	1-7	2-3	2-5	3-4	3-6	3-7	4-5	4-7	5-6
173											
1-2	1-2	1-5	1-7	2-3	2-5	3-4	3-6	4-5	4-7	5-6	6-7
174											
1-2	1-3	1-6	1-7	2-3	2-5	3-4	4-5	4-6	4-7	5-6	5-7
175											
1-2	1-3	1-6	1-7	2-3	2-4	2-5	3-4	4-6	4-7	5-6	5-7
176											
1-2	1-3	1-7	2-3	2-4	2-5	3-4	3-5	4-6	4-7	5-6	6-7
177											
1-2	1-3	1-5	1-7	2-3	2-5	2-6	3-4	4-5	4-6	5-7	6-7
178											
1-2	1-4	1-6	1-7	2-3	2-5	3-4	3-6	3-7	4-5	5-6	5-7
179											
1-2	1-6	1-7	1-7	2-3	2-3	3-4	3-7	4-5	4-5	5-6	5-6
180											

1-2	1-5	1-5	1-6	2-3	2-3	3-4	3-7	4-5	4-5	6-7	6-7
181											
1-2	1-6	1-7	1-7	2-3	2-3	3-4	3-7	4-5	4-5	4-6	5-6
182											
1-2	1-4	1-7	1-7	2-3	2-3	3-4	3-7	4-5	4-6	5-6	5-6
183											
1-2	1-2	1-5	1-6	2-3	3-4	3-7	4-5	4-5	4-5	6-7	6-7
184											
1-2	1-4	1-6	2-3	2-7	2-7	3-4	3-4	4-5	5-6	5-6	6-7
185											
1-2	1-6	1-7	1-7	2-3	2-3	2-6	3-4	4-5	4-5	4-7	5-6
186											
1-2	1-6	1-7	1-7	2-3	2-3	2-6	3-4	4-5	4-7	5-6	5-6

CATALOG 24 (3 Entries)

1							
1-2	1-2	1-4	1-4	2-3	2-3	3-4	3-4
2							
1-2	1-2	1-4	1-4	2-3	3-4	3-4	3-4
3							
1-2	1-2	1-3	1-4	2-3	2-4	3-4	3-4

CATALOG24 (54 Entries)

1										
1-2	1-3	1-6	2-4	2-5	3-4	3-5	3-6	4-5	4-6	5-6
2										
1-2	1-4	1-6	2-3	2-5	3-4	3-4	3-6	4-5	5-6	5-6
3										
1-3	1-4	1-6	2-3	2-4	2-6	3-4	3-5	4-5	5-6	5-6
4										
1-2	1-3	1-6	2-3	2-6	3-4	3-5	4-5	4-5	4-6	5-6
5										
1-2	1-3	1-6	2-3	2-5	2-6	3-4	3-5	4-5	4-6	5-6
6										
1-2	1-3	1-6	2-3	2-4	3-5	3-6	4-5	4-5	4-6	5-6
7										
1-2	1-3	1-6	2-3	2-3	2-4	3-5	4-5	4-5	4-6	5-6
8										
1-2	1-3	1-3	1-6	2-3	2-4	3-5	4-5	4-5	4-6	5-6
9										
1-2	1-2	1-5	1-6	2-3	2-3	3-4	3-6	4-5	4-6	5-6
10										
1-2	1-5	1-6	2-3	2-3	2-5	3-4	3-6	4-5	4-6	5-6
11										
1-2	1-5	1-6	2-3	2-4	3-4	3-6	3-6	4-5	4-5	5-6
12										
1-2	1-3	1-5	2-3	2-4	3-6	3-6	4-5	4-5	4-6	5-6
13										
1-2	1-3	1-5	2-3	2-5	3-4	3-4	4-6	4-6	5-6	5-6
14										
1-2	1-6	1-6	2-3	2-3	3-4	3-4	4-5	4-5	5-6	5-6
15										
1-2	1-2	1-6	2-3	3-4	3-4	3-6	4-5	4-5	5-6	5-6
16										
1-2	1-2	1-6	2-3	2-6	3-4	3-4	4-5	4-5	5-6	5-6
17										
1-2	1-2	1-2	1-6	2-3	3-4	3-4	4-5	4-5	5-6	5-6
18										
1-2	1-2	1-3	1-6	2-3	2-6	3-4	4-5	4-5	5-6	5-6
19										
1-2	1-2	1-3	1-6	2-3	2-6	3-4	3-4	4-5	5-6	5-6
20										
1-2	1-2	1-6	2-3	2-4	3-4	3-6	4-5	4-5	5-6	5-6
21										
1-2	1-2	1-3	2-3	2-4	3-4	3-6	4-5	4-5	5-6	5-6
22										
1-2	1-2	1-3	1-6	2-3	2-4	3-4	4-5	4-5	5-6	5-6
23										
1-2	1-2	1-3	1-6	2-3	2-3	3-4	4-5	4-5	5-6	5-6
24										

1-2	1-4	1-6	2-3	2-3	3-4	3-6	4-5	4-5	5-6	5-6
25										
1-2	1-2	1-6	2-3	2-3	3-4	3-6	4-5	4-5	5-6	5-6
26										
1-2	1-2	1-2	1-3	2-3	3-4	3-6	4-5	4-5	5-6	5-6
27										
1-2	1-3	1-6	2-3	2-3	3-4	4-5	4-5	4-6	5-6	5-6
28										
1-2	1-2	1-3	2-3	3-4	3-6	4-5	4-5	4-6	5-6	5-6
29										
1-2	1-2	1-2	1-6	2-3	3-4	3-4	3-6	4-5	5-6	5-6
30										
1-2	1-2	1-2	1-6	2-3	3-4	3-6	4-5	4-5	5-6	5-6
31										
1-2	1-2	1-6	2-3	2-6	3-4	3-4	3-5	4-5	5-6	5-6
32										
1-2	1-2	1-6	2-4	3-4	3-4	3-5	3-6	4-5	5-6	5-6
33										
1-2	1-2	1-6	2-3	2-4	3-4	3-5	3-6	4-5	5-6	5-6
34										
1-2	1-2	1-3	1-6	2-4	3-4	3-4	3-5	4-5	5-6	5-6
35										
1-2	1-3	1-4	1-6	2-3	2-4	3-4	3-5	4-5	5-6	5-6
36										
1-2	1-4	1-6	2-3	2-3	3-4	3-5	4-5	4-6	5-6	5-6
37										
1-2	1-2	1-3	1-4	2-3	3-4	3-5	4-5	4-6	5-6	5-6
38										
1-2	1-2	1-4	2-3	3-4	3-5	3-6	4-5	4-6	5-6	5-6
39										
1-2	1-2	1-4	2-3	2-6	3-4	3-5	4-5	4-6	5-6	5-6
40										
1-2	1-2	1-3	1-6	2-3	3-4	3-5	4-5	4-6	5-6	5-6
41										
1-2	1-2	1-2	1-6	2-3	3-4	3-5	4-5	4-6	5-6	5-6
42										
1-2	1-2	1-2	1-4	2-3	3-4	3-5	4-5	4-6	5-6	5-6
43										
1-2	1-2	1-6	2-3	2-6	3-4	3-4	3-4	4-5	5-6	5-6
44										
1-2	1-2	1-2	1-6	2-3	3-4	3-4	3-4	4-5	5-6	5-6
45										
1-2	1-3	1-6	2-3	2-3	2-4	3-4	4-5	4-6	5-6	5-6
46										
1-2	1-2	1-3	1-6	2-4	3-4	3-4	3-6	4-5	5-6	5-6
47										
1-2	1-2	1-6	2-3	2-5	3-4	3-4	3-6	4-5	5-6	5-6
48										
1-2	1-3	1-6	2-3	2-3	2-4	3-4	4-5	5-6	5-6	5-6
49										
1-2	1-3	1-4	2-3	2-4	3-4	3-6	4-5	5-6	5-6	5-6
50										

1-2	1-2	1-4	2-3	3-4	3-4	3-6	4-5	5-6	5-6	5-6
51										
1-2	1-3	1-4	2-3	2-3	3-4	4-5	4-6	5-6	5-6	5-6
52										
1-2	1-2	1-3	2-3	3-4	3-4	4-5	4-6	5-6	5-6	5-6
53										
1-2	1-4	1-6	2-3	2-3	2-3	3-4	4-5	5-6	5-6	5-6
54										
1-4	1-6	1-6	2-3	2-3	2-3	2-6	3-4	4-5	4-5	5-6

CATALOG 5 (6 Entries)

1										
1-2	1-2	1-2	1-5	2-3	3-4	3-4	3-5	4-5	4-5	
2										
1-2	1-2	1-5	1-5	2-3	2-3	3-4	3-4	4-5	4-5	
3										
1-2	1-2	1-5	1-5	2-3	2-5	3-4	3-4	4-5	4-5	
4										
1-2	1-3	1-4	1-5	2-3	2-3	2-4	3-5	4-5	4-5	
5										
1-2	1-3	1-4	1-5	2-3	2-4	2-5	3-4	3-5	4-5	
6										
1-2	1-2	1-2	1-5	2-5	3-4	3-4	3-4	3-5	4-5	